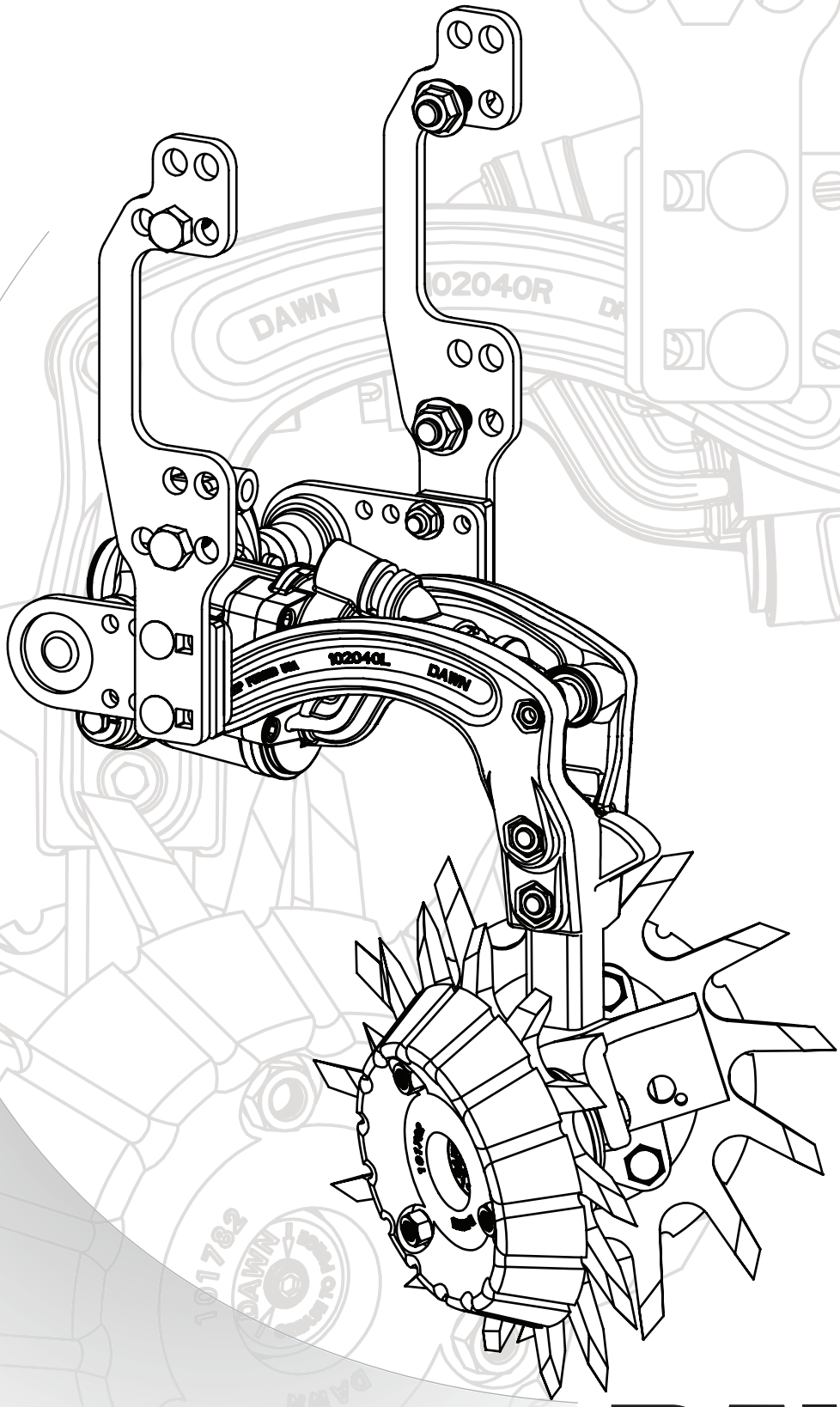
Dawn Model 5010 GroundFX Row Cleaner

Assembly and Operation Manual



DAWN®

2014_02_5010

Introduction

PLEASE CAREFULLY READ THIS MANUAL

It is strongly recommended that you become familiar with all operation and maintenance procedures concerning your Dawn agricultural equipment.

Failure to follow safety recommendations while this implement is in operation, and/or failure to properly store this implement, and/or failure to adequately prepare this implement for transport, could result in equipment damage, personal injury or death. Please make yourself aware of all federal and local laws that may apply to the transport, use and sale of this implement.

USING THIS MANUAL

All Dawn manuals are named and numbered and should be considered a principal element of the device they accompany. Please ensure this manual is kept in a location not subject to extreme conditions (i.e. excess humidity, hydraulic fluid, exposed to natural elements, etc.). Please ensure that this manual remains with the implement if traded, leased, or sold.

WARRANTY INFORMATION

All new Dawn Equipment company products carry a limited warranty. Warranty assurances vary by device, and can be found in the appendices of this or any other Dawn Equipment Company users manual. Warranty information is also available upon request by contacting Dawn toll-free at 800.554.0007, or you can request a copy in writing. Request warranty information by e-mail at **info@dawnequipment.com**, or by US post at

Dawn Equipment Company
PO Box 497
Sycamore, IL 60178

Dawn Equipment Company prides itself on the manufacture of quality American made row crop tools. Warranties will be honored by Dawn to dealers authorized to sell Dawn Equipment products who, in turn, honor such warranties to the original retail purchaser. Should this equipment be improperly cared for, or should it be modified to change performance beyond OEM specifications, applicable Dawn warranties will become void, and Dawn sponsored implement improvements will not be granted.

DISCLAIMER

Dawn Equipment Company makes no claim to the safety or reliability of non-Dawn OEM parts or whole goods used in conjunction with Dawn OEM equipment, and shall not be held responsible for any personal injury or property damage, or for any complications with operational performance caused by non-Dawn OEM parts or whole goods used in conjunction with Dawn OEM equipment. Please familiarize yourself with the users manuals and safety recommendations of all non-Dawn OEM equipment.

WEIGHTS AND MEASURES

All Dawn Equipment Company part and whole good designs adhere to the United states Customary Unit System (Inch-Pound). All measurements in this manual are labeled using only the aforementioned units, unless otherwise explicitly specified.

ADDITIONAL INFORMATION

Additional information on this, and any other Dawn tool can be found on the web at **www.dawnequipment.com**. You may also contact Dawn for information by phone at **800.554.0007**, or by fax at **815.899.3663**, or by email at **info@dawnequipment.com**

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GENERAL SAFETY

It is essential that you be able to recognize safety signal words and their associated symbols. Please be alert to any signs posted on your Dawn Equipment Company products, and/or in your users manual. Make sure you have read all safety messages and that you clearly understand the recommended precautions. If you have any questions about any Dawn safety sign, or have further questions about the safety recommendations on this or any other Dawn product, please contact Dawn Equipment Company at 800.554.0007.

SAFETY TRIGGERS

Several safety symbols appear with their associated safety words throughout your Dawn Equipment user manual. It is important to recognize and understand these safety signals in order to take appropriate action as necessary.

⚠ **DANGER** - Indicates an imminently hazardous situation that, if not avoided, will result in serious injury or death, and/or property damage

⚠ **WARNING** - Indicates a potentially hazardous situation that, if not avoided, will result in serious injury or death, and/or property damage.

⚠ **CAUTION** - Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury, and/or property damage.

REPORTING AN EMERGENCY

Ensure that you have access to a radio or a mobile phone when operating or repairing farm machinery. Working with a partner whenever possible significantly increases the chances of receiving timely emergency care should one party become severely injured, and/or incapacitated.

MAINTENANCE AND UPKEEP

For safety reasons, it is important to keep your implements in proper working order. Unauthorized modifications to Dawn Equipment Company products may compromise the efficiency and/or safe operation of the product and will void any and all warranties through Dawn Equipment Company. Please read your manual before attempting any repair work to your Dawn tool. If you need to work on your Dawn tool, make sure to support it before partially or fully removing it from the attachment points. Do not adjust your Dawn tools while they are moving. Before making adjustments to your Dawn fx tool, make sure to disengage the hydraulic circuit and disconnect the power source.

PROPER WASTE DISPOSAL

Please familiarize yourself with all waste disposal laws applicable to your area before dumping.

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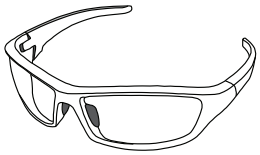
SAFETY GEAR

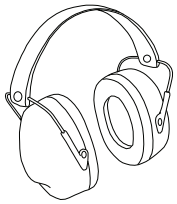
PROTECTIVE CLOTHING

Wearing proper attire when working on agricultural equipment is a critical safety precaution. Loose clothing or accessories may become entangled in moving parts causing serious injury or death. Please ensure that loose cuffs, shirts, belts, jewelry, etc. are secured such that they cannot be drawn into moving machinery. Stay aware of your surroundings when in the proximity of machinery that is either moving or has the potential for spontaneous movement. Equip yourself with all recommended safety accessories, and develop a strategy for ensuring their use when needed.

SAFETY GLASSES/GOGGLES

If you will be using hazardous chemicals, or are striking, cutting or grinding metal make sure you are wearing eye protection.



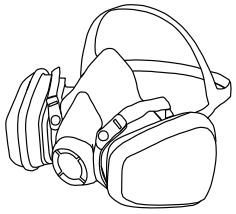


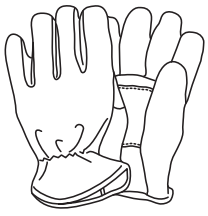
EARPLUGS / SOUND MUFFLERS

When working around equipment that generates high amplitude sound (ie dryers, vacuums, etc.) ear protection is strongly recommended.

RESPIRATOR MASK

Carefully read all safety information associated with any chemicals you will be handling. Use a respirator mask when using hazardous chemicals, (ie Insecticides, NH3, etc.)





WORK GLOVES

If working around machinery with sharp edges, or rough metal surfaces, work gloves may prevent a few stitches. Work gloves are inexpensive, and are really worth the investment.

STEEL-TOED BOOTS

A good pair of steel-toed boots can safe your toes. Avoid an unfortunate accident, and protect your feet.

FIRST AID KIT

In order to minimize the risk of infection, every shop and tractor should have a complete first aid kit.

FIRST AID KIT CONTENTS

According to the National Agricultural Safety Database (NASD) and Canadian Agricultural Safety Association (CASA), each first aid kit should include the following;

- Poison First Aid Kit with syrup of Ipecac and charcoal
- Sterile first aid dressings in sealed envelope (2”x 2” for small wounds, 4”x 4” for larger wounds and a compress to stop bleeding)
- Tongue blades
- Stainless steel bandage scissors (strong enough to cut denim)
- Tweezers
- Eye was solution
- Thermometer
- Safety pins
- Ace bandage
- “Band-aids”
- Roller bandage 1”x 5 yds. (for fingers)
- Roller bandage 2”x 5 yds. to hold dressings in place
- Adhesive tape
- Triangular bandages for a sling or as a covering over a larger dressing
- Cotton balls for cleaning wounds or applying medication
- Splints 1/4” thick, 1/2” wide, 12-15” long for splinting broken arms and legs
- 70% isopropyl alcohol and tincture green soap in a covered container for cleaning
- Ice packs (chemical ice bags) to use to reduce swelling
- Several pairs of disposable latex or nitrile gloves
- Waterless hand wash
- Emergency tourniquet (or elastic wrap/tubing)
- Amputation preservation kit consisting of plastic bags: one large garbage bag, four kitchen-sized and two bread bags

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SAFETY INFORMATION

Gfx SAFETY CONSIDERATIONS

⚠ **WARNING!**: It is imperative that you familiarize yourself with this device and its operation before attempting any service or operation.

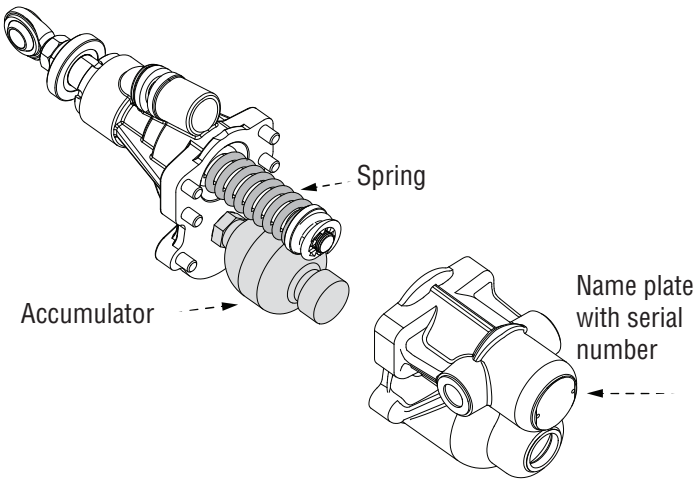
HYDRAULIC CONSIDERATIONS

⚠ **WARNING!**: The Gfx is a high pressure hydraulic device. Always fully discharge any system pressure prior to attempting any service of the hydraulic system. Always make sure hydraulic fittings are tight before operation. Consult your tractor owner manual if necessary to determine proper way of discharging system pressure. Always place SCV valve into float position prior to disconnecting from tractor.

⚠ **WARNING!:** The Gfx unit is a high precision hydraulic device. Always try to work on assembly in a shop environment that is as clean as possible. When performing installation avoid exposing the hydraulic circuit to the open air until it is absolutely necessary to complete an assembly step. Minimizing the contamination of the hydraulic components with dirt and debris will have a direct effect on the longevity of the seals and other components.

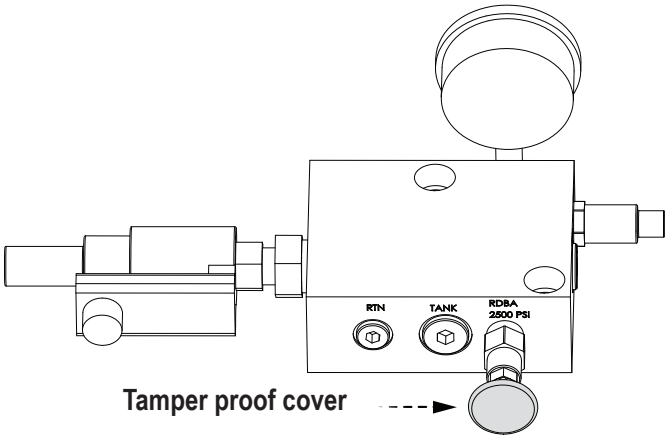
PROTECTIVE CASTING

The protective casting makes up a large portion of the Gfx unit volume. This protective casting encases a hydraulic accumulator which stores a large amount of energy. Never remove the protective cover from the unit without first discharging hydraulic pressure from the circuit. The accumulator should be serviced only after pressure is removed from the unit. No service or modification should be done to the accumulator.



TAMPER PROOF COVER

The tamper proof cover is located on the relief valve which comes installed on the pressure control manifold. Do not remove, damage or destroy this protective cover. Do not change relief valve settings. All service to this manifold should be done by an authorized Dawn distributor or by Dawn Equipment Company.

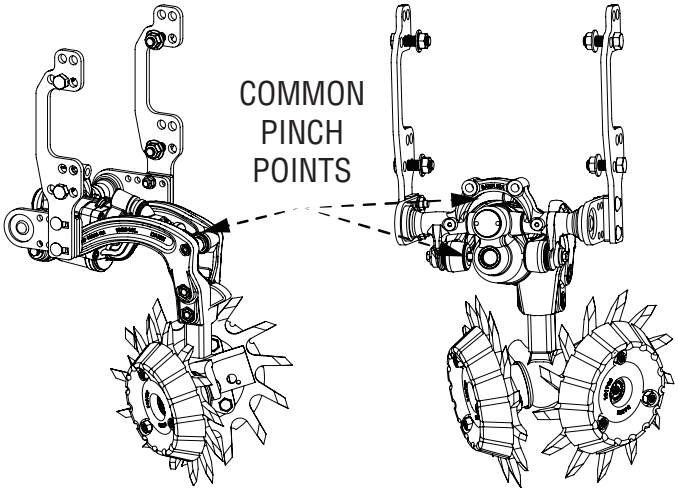


PINCH POINTS

The Gfx is a dynamic device which connects many points of articulation where hands or loose clothing can become caught. For your safety, please be aware of how the unit operates and stay clear of pinch points.

⚠ **WARNING!:** Operating or servicing the Gfx or planter row unit with Gfx hydraulic circuit charged may result in loss of limb or death. Only service unit with hydraulic line pressure discharged.

⚠ **WARNING!:** Never remove unit fixing bolts without first discharging the circuit pressure and supporting the planter row unit with a jack or by resting on ground.



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PRE-INSTALLATION - SPACER KITS

UNIVERSAL MOUNTING SYSTEM

The Dawn Gfx and its universal mounting system is designed to fit a variety of modern planters. Due to the nature and variety of Original Equipment Manufacturers (OEMs), installation of individual row units will depend on a highly variable set of circumstances. As a result, care needs to be taken to insure compatibility as well as proper installation procedure. There may arise situations in which it will take some basic logistical skill in order to complete a functional and safe installation. If you do not feel comfortable installing your row units, please contact your dealer. For updated information about Dawn products, please visit us online at www.DawnEquipment.com or call us toll free at 800.554.0007

NOTE Some areas of interference may be alleviated with Dawn setback kits. Please check the setback row diagrams in the following section for detail. If you have questions, contact your Dawn dealer or Dawn Equipment Company for installation advice.

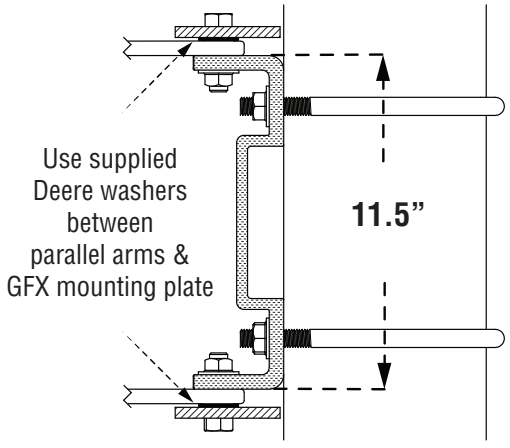
PLANTER ROW UNIT WIDTH

The three most common planter widths are defined below. To insure fit, measure the width of the "flying-W" or row unit mount bracket prior to ordering Gfx units. The Gfx yoke (Dawn p/n 200959) is 12.75" wide.

NOTE All figures show motion of travel from left to right.

John Deere NARROW - 11.5" flying-W

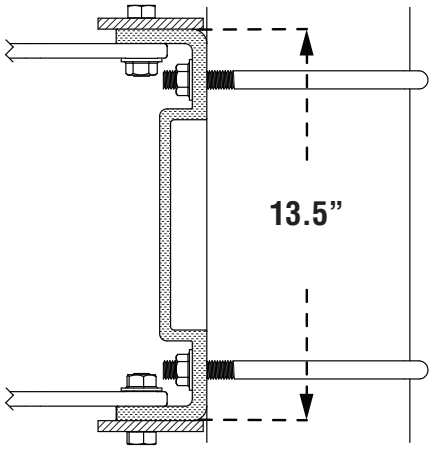
- Requires Dawn kit #**300423**



NOTE Bauer ships most of their toolbars with planters with the John Deere narrow unit configuration where the parallel arms sit on the OUTSIDE of the flying-W.

John Deere WIDE - 13.5" flying-W

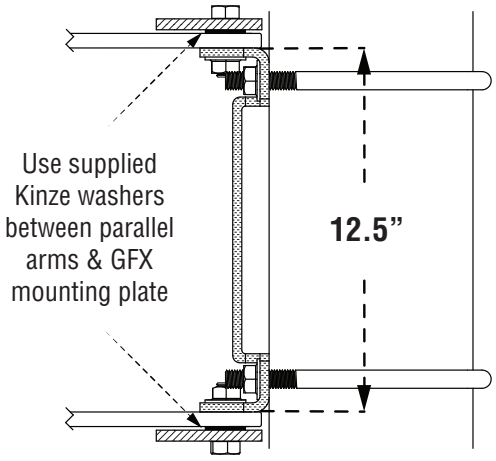
- Requires Dawn kit #**300424** which includes 3/8" spacers.



NOTE John Deere ships most of their toolbars (1770, for example) with planters in this wide row unit configuration where the parallel arms sit on the INSIDE of the flying-W.

Kinze Units - 12.5" flying-W

- Requires Dawn kit #**300475** which includes 1/2" spacers.



NOTE Kinze ships most of their compatible row units in this configuration with the parallel arms on the OUTSIDE of the flying-W.

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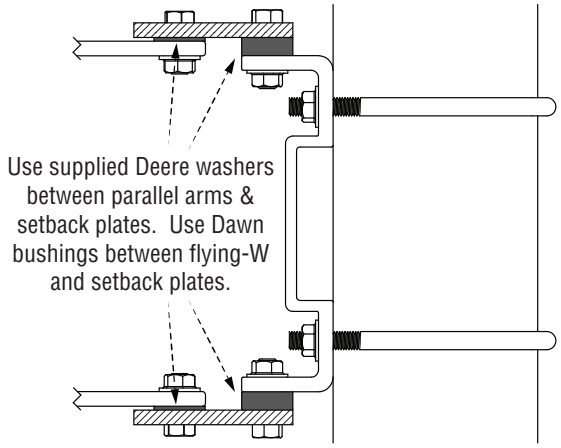
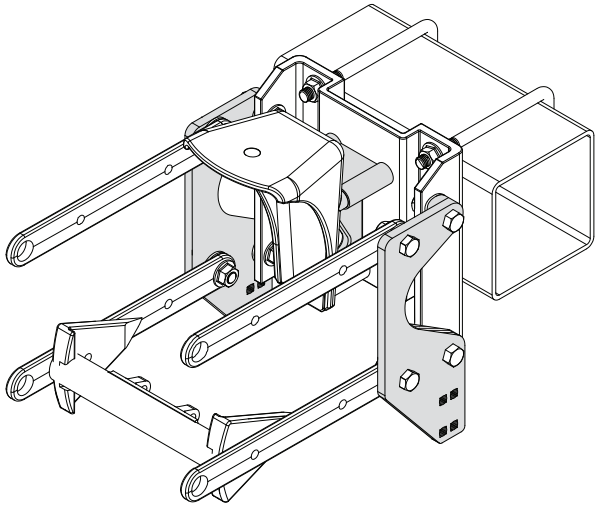
PRE-INSTALLATION - SPACER KITS

SETBACK ROWS

Some rows on your planter may face significant interference from varying design necessities such as folding points, seed vacuum tubes, weldments, toolbar and wing lift tires to name a few. In these situations, it will be necessary to install setback kits to insure proper function of your Gfx row cleaners. A Dawn setback kit is required for all setback units.


Use supplied Deere washers between parallel arms & setback plates. Use Dawn bushings between flying-W and setback plates.



kit #**300388-UNIV:** Correct orientation of Dawn setback mount plates with Deere airbag spacer.

NOTE Deere hardware supplied by dealer or third party. Dawn does not and will not stock John Deere parts. John Deere parts and part numbers subject to change without notice.

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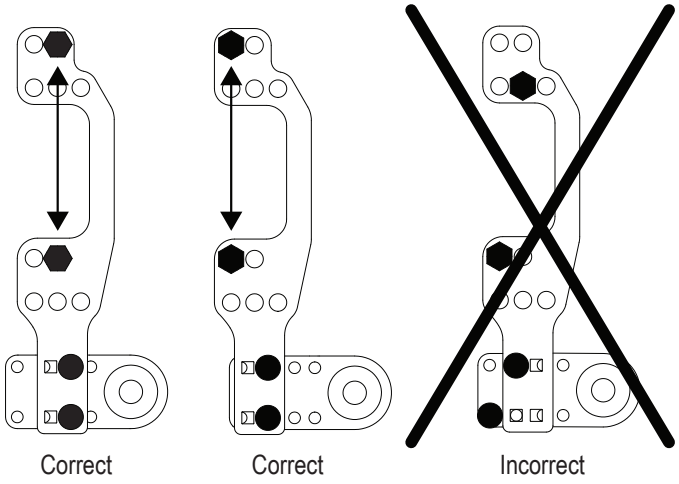
PRE-INSTALLATION - BOLT CONFIGURATIONS

MOUNTING PLATE BOLT CONFIGURATION

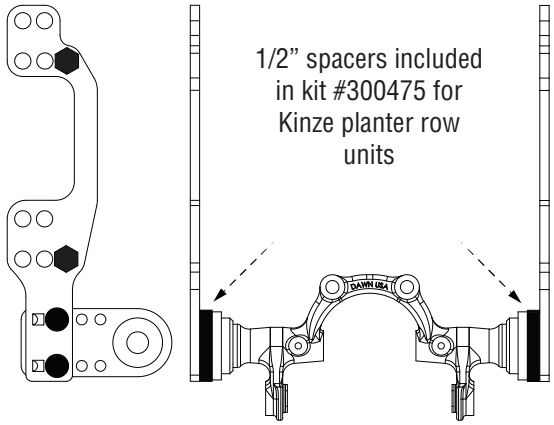
Please refer to these diagrams for a selection of the most common bolt configurations in order to place your Dawn Gfx mounting plates and Gfx row unit correctly in relation to your planter row unit and toolbar. As a general rule, you will want to mount your Gfx units in a way that allows free movement along the full length of travel.

DO NOT tighten bolts until mount plates and Gfx yoke are installed. Refer to bolt torque specifications in the following installation guide. **DO NOT** over tighten bolts.

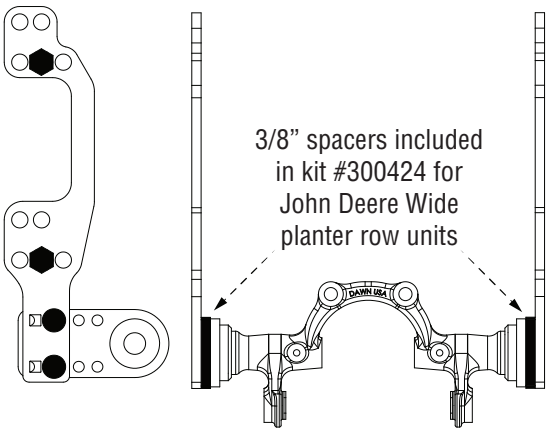
NOTE All figures show motion of travel from left to right.



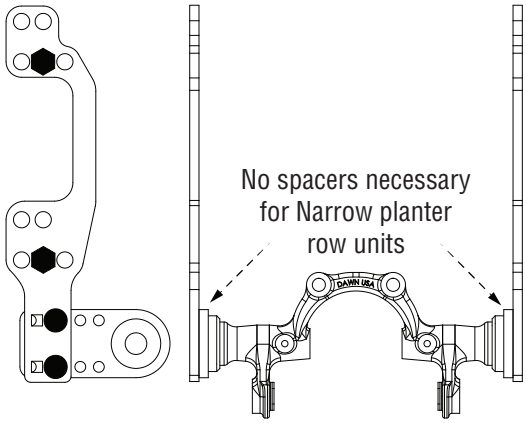
NOTE All bolt pairs must be aligned vertically!



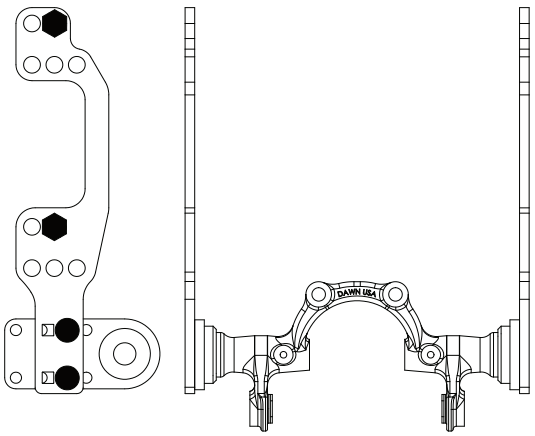
Kinze 12.5" row unit width with 1/2" spacers between Gfx yoke and mounting plate.



John Deere 13.5" row unit width with 3/8" spacers between Gfx yoke and mounting plate.



DB toolbars with 11.5" John Deere planter row unit width use NO spacers between Gfx yoke and mounting plate.



For John Deere units with long parallel links.

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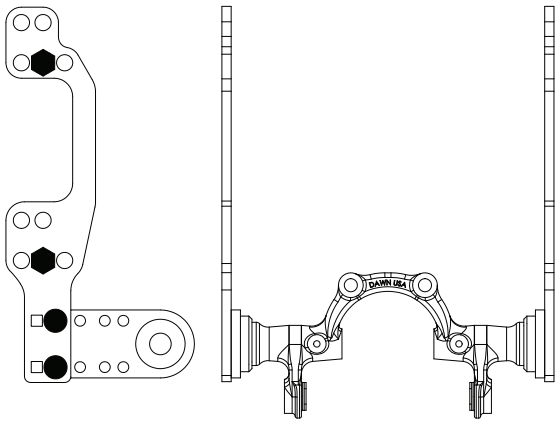
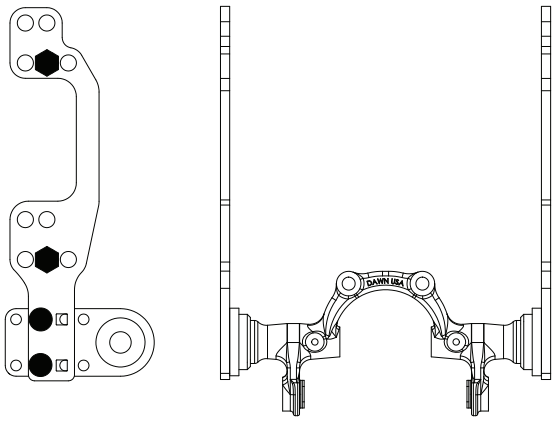
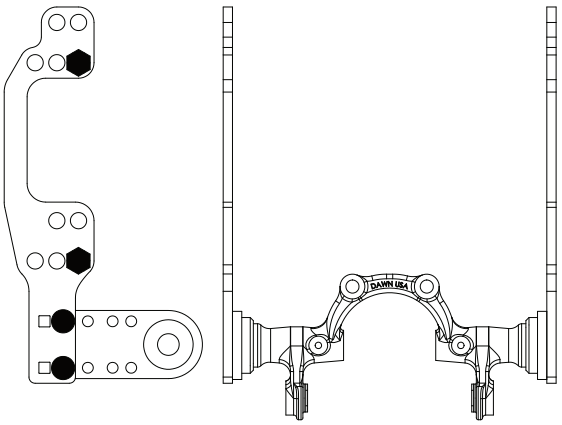
PRE-INSTALLATION - BOLT CONFIGURATIONS



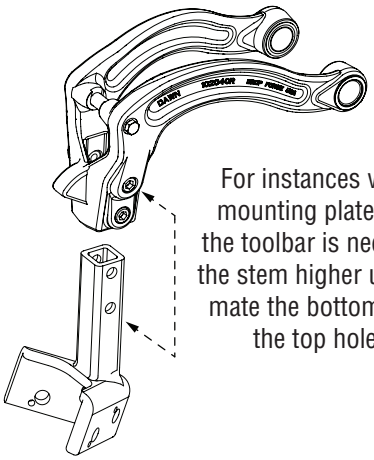
For John Deere units with 14” or 15” Trashwheels.



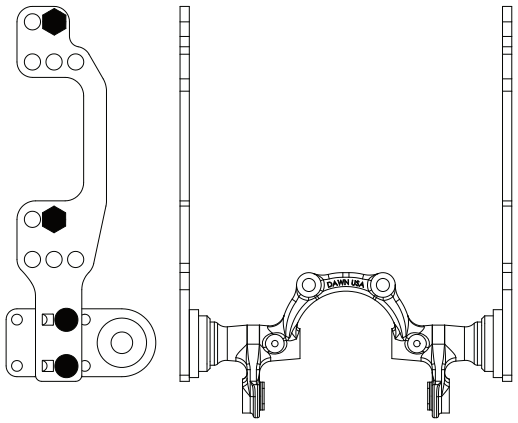
For John Deere units with heavy duty scrapers.



1770NT middle rows where plate is welded under toolbar.



For instances where attaching the mounting plate lower in relation to the toolbar is needed, you can mount the stem higher using only one bolt to mate the bottom hole of the stem to the top hole of the Gfx arm.



For DB toolbar rows near gauge wheel weldments.

NOTE The diagrams compiled represent SOME of the most common configurations. Your specific planter may need a mounting configuration not mentioned in this guide. Please call Dawn Equipment for interferences not encountered in this document.

tip In most cases, you will be able to shift a row unit side-to-side by small margins to clear potential interference. Be sure to measure your planters row units to check their spacings before attempting to shift any row units.

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INSTALLATION - MOUNT PLATES

UNIVERSAL MOUNT PLATE INSTALLATION

IMPORTANT! Before attempting installation, read the previous sections of this manual outlining spacer kits and bolt configurations for proper mounting information. As a general rule, planter manufacturers differ in their dimensions and will require different spacers and bolt configurations.

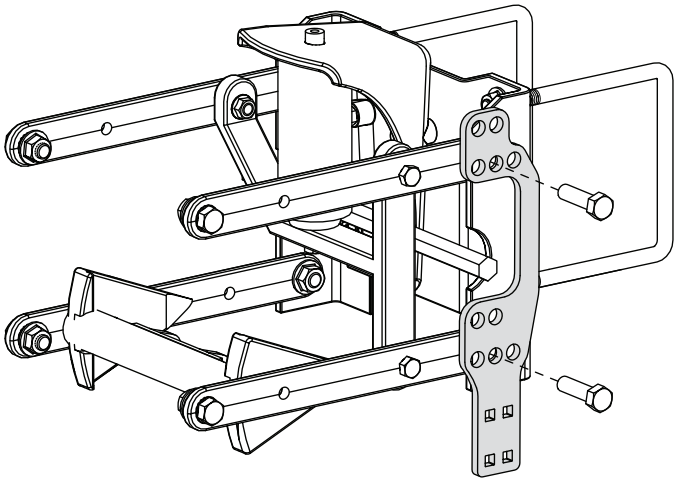
tip: Installation of the mounting plates/row units is best performed with the toolbar in planting position on a level floor inside a shop. Individual preference may vary.

tip: You may want to work on only one side of the row unit at a time to avoid fully detaching unit from frame. Setback rows will require full removal.

1 Remove pressure from down force springs and/or air bags attached to row units. See OEM manual for directions.

2 With planter row unit properly supported, remove parallel link bushing bolts one side at a time. If you are installing a set-back kit, remove all four parallel link bolts and move row unit back 3 inches to accomodate set-back plate.

3 Bolt Gfx mounting plate according to the previous sections outlined in this manual. Pay attention to OEM bushing and hardware placement.

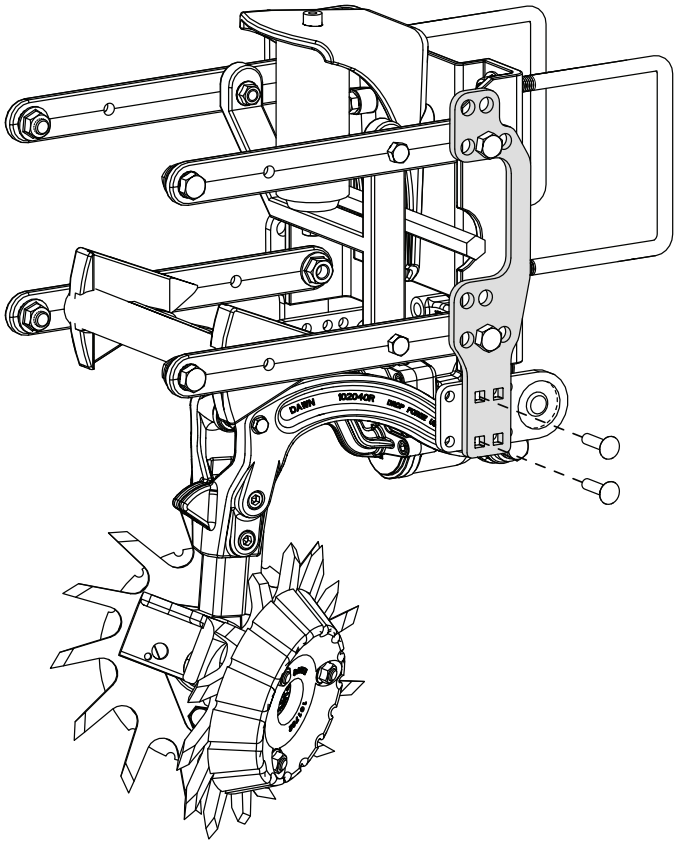


⚠ **CAUTION!:** Refer to bolt configurations section of manual to identify proper placement of bracket.

4 Repeat process for all bolts on parallel links. Do not fully torque bolts until final stage of assembly.

Gfx YOKE & CYLINDER ASSEMBLY INSTALLATION

Once mounting plates are installed, the cylinder assembly can be attached to the planter. Refer to the **BOLT CONFIGURATION** section of this manual for proper bolt placement and yoke attachment.



⚠ **CAUTION!:** Refer to bolt configurations section of manual to identify proper placement of bracket.

⚠ **CAUTION!:** DO NOT remove caps from hoses before necessary.

MOUNTING PLATE BOLT TORQUE SPECIFICATIONS
ALL 7/16” GR5 bolts are to be torqued to 70 ft·lb
ALL 5/8” GR8 bolts are to be torqued to 180 ft·lb

tip: Check that your row units are uniformly spaced before making any drastic changes to Gfx mounting configurations. Some interference may be avoided in this way.

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TRASHWHEELS, DEPTH BANDS

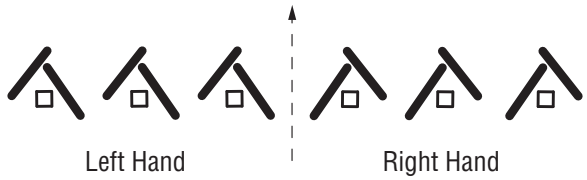
TRASHWHEEL ASSEMBLY INFORMATION

The positionof the wheels and optional depth band attachments will drastically change the performance of your Dawn Trashwheels. Please review your options and discuss them with an authorized Dawn dealer before installation.

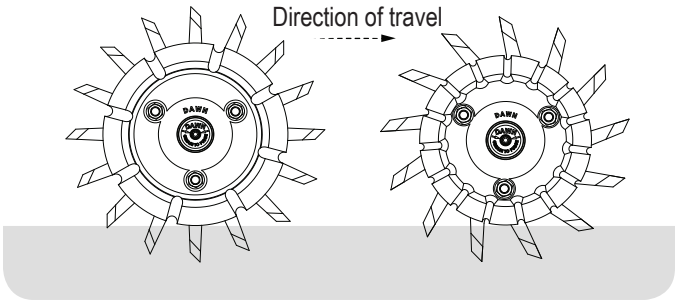
OFFSET VS. INTERSECTING

In general, row cleaners should only be put in the intersecting position if there is a specific reason to do so. if a very aggressive row cleaning is required such as where the planter is being run directly over the top of the previous years corn stalk, intersecting 14" Trashwheels may be a good option. For most no-till applications, it is not necessary to run your Dawn Trashwheels in the intersecting position. In conventionally tilled ground, intersecting wheels can result in plugging problems. ONLY 14 inch wheels with straight teeth can be set to the intersecting position. 12.75 inch and 15 inch wheels MUST be set in the offset position.

FOR MOST APPLICATIONS, AN OFFSET CONFIGURATION IS PREFERRED.



NOTE To funnel residue outward from the center of the planter, assemble half of your Trashwheels in the LEFT handed configuration and half of your Trashwheels in the RIGHT handed configuration.



NOTE Trashwheels are directional! Proper installation requires that the Trashwheels be assembled with tines sweeping back from the direction of travel.

DEPTH BANDS

For most growers the default configuration of the Gfx unit includes the molded poly depth band. The depth band acts as a gauge to keep the Trashwheels from becoming too aggressive. In some heavy residue conditions it will be better to remove the depth band in order to increase the aggressiveness of the Trashwheel. If you are no-tilling into heavy corn stalks and the unit is not moving as much residue as you want at maximum hydraulic pressure the first thing you should do is remove the depth bands. The depth bands limit the amount of tooth that is exposes and in some cases the field residue is thicker than the length of exposed tooth of the Trashwheel.

NOTE For most shipments, Trashwheel, hub, and depth band assembly is taken care of in house by Dawn. If your Trashwheels have been shipped already assembled, feel free to skip this procedure.

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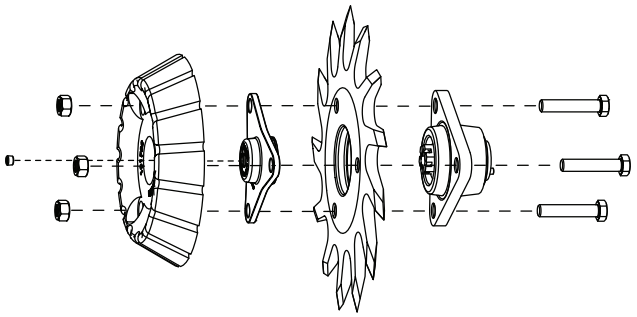
INSTALLATION - TRASHWHEELS

NOTE Parts subject to change! Please refer to attached parts diagram at the end of this manual. For updated parts, please refer to www.DawnEquipment.com

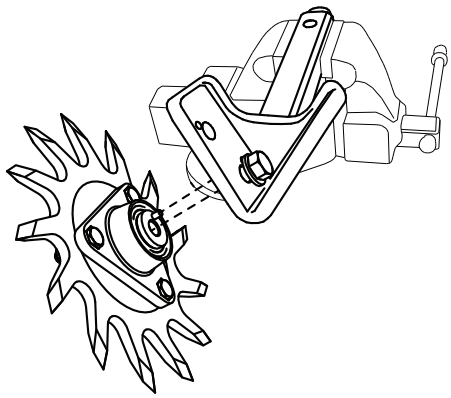
1 Lightly grease O-ring and place into groove on the underside of the aluminum Supercap. Do not install pipe plug until the end.

2 To assemble Trashwheel with depth band, insert each bolt through hub flange, Trashwheel, Supercap, depth band and loosely thread on nut. Repeat for the other two bolts.



3 Once all nuts are threaded onto bolts, tighten down making sure not to crack depth bands.

4 After all Trashwheels are assembled, clamp a stem weldment into a bench vise by its square tube.



5 Attach assembled Trashwheels to stem weldment by inserting bolt through washer, stem weldment, and into Trashwheel hub.

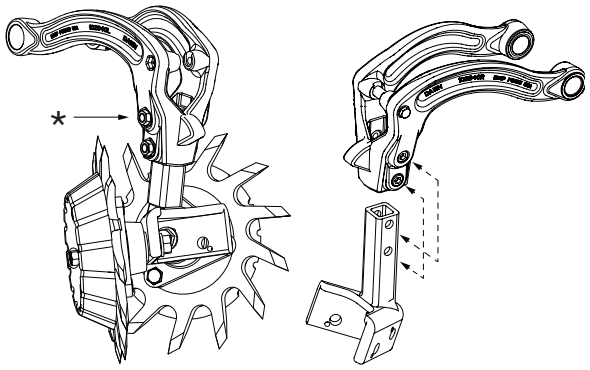
tip: It is easier to bolt the leading wheel to the stem weldment before the rear wheel due to wrench clearance.

INSTALLATION OF STEM ASSEMBLY

Once Traswheels are assembled and installed on the stems, you can install them into the arm weldments of the Gfx primary row unit structure.

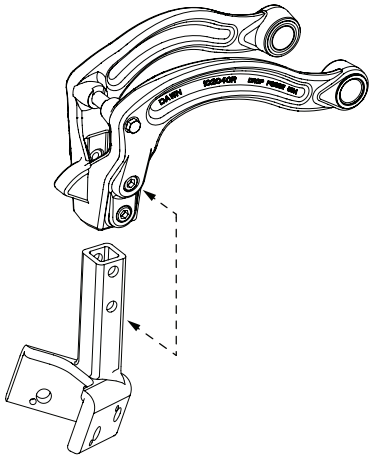
1 Slide stem assembly into the receiver tube of the Gfx swing-arm assembly. Stem will have a bit of play in receiver tube and fit loosely.

2 Insert upper bolt to retain assembly. Thread nut onto upper bolt and tighten down securely. Repeat with lower bolt and nut.



3 Thread on and tighten down jam nut to secure retention bolts.

* Due to forging die wear, you may need to insert a flat-head screw driver to secure nut when tightening.



tip If you are in loose worked ground you can raise stem for less aggressive row cleaning action.

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HYDRAULIC CIRCUIT ASSEMBLY & ROUTING

HYDRAULIC CIRCUIT ASSEMBLY

Dawn hydraulic systems use multiple standardized connections which are non-interchangable. It is important to recognize each component to determine a proper connection to avoid death, personal injury and/or property damage. ww

⚠ **CAUTION!:** Many planters require special considerations for hydraulic line routing. If a custom hose is needed use only CE approved SAE 100R2 hose with a minimum operating pressure of 3000psi. Daisy chain hoses should be a 1/4in hose using Parker or equivalent -4 ORFS (O-Ring Face Seal) hose ends. Dawn does not accept any liability for the performance of hoses made by a 3rd party.

PRESSURE SPECIFICATIONS

When installing or assembling hydraulic fittings and hoses, it is important to use fittings and hoses that are rated to at least the maximum published pressure of the hydraulic circuit. Refer to your tractor/hydraulic pump literature to determine this pressure. Analog gauges cannot be used to accurately measure surge or peak pressures as they represent an average.

HYDRAULIC CIRCUIT ROUTING

Hose routing is extremely important in order to prevent premature component failure due to flow restriction from heat deformation, kinking, twisting, etc. This guide will provide some basic hose routing recommendations to avoid common problems. Due to the varied nature of planters and tractor configurations, some common sense must be used to determine optimum hose routing options.

Length

Hose length will vary depending on motion absorbtion, pressure variants, restraints/supports and machine tolerances. Always run a hose slightly longer than the actual difference to account for these conditions.

Securing Hoses & Physical Stress

In certain instances, retaining, securing and preventing hoses from damage by kinking, frame interference or twisting will be necessary. It is important to ensure that this process does not add a point of stress or wear on the line. Excessive flexing, twisting, kinking, tensile/side loads, accute bend radius, and vibration can significantly reduce the life of the hose or in some cases lead to premature failure if the hose is not secured properly! Any hose that is kinked or cracked before installation must be discarded.

ENVIRONMENTAL CONDITONS

Environmental wear from ultraviolet radiation/sunlight, heat, ozone, moisture, salt, chemicals and air pollutants can call premature wear and lead to failure if not replaced.

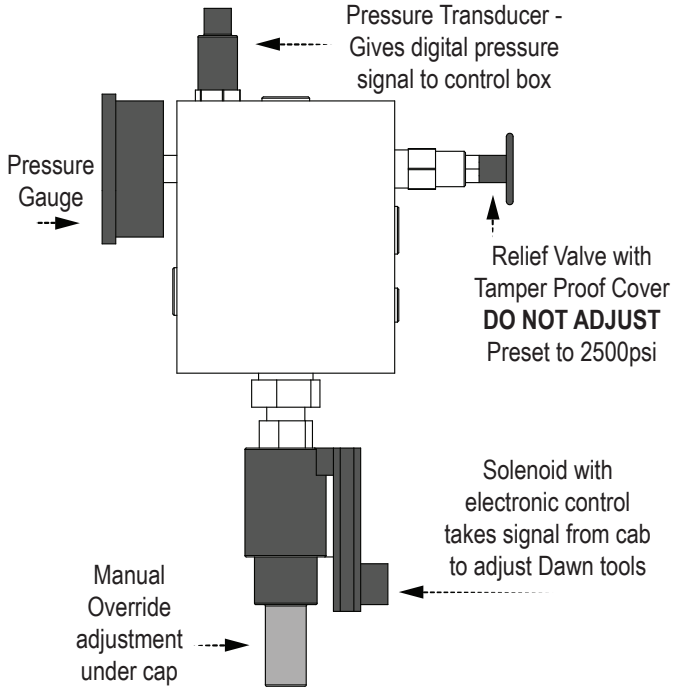
WARNING!: Though JIC, ORB and ORFS hydraulic fittings are incompatible and should not fit together, ALWAYS make sure you have an appropriately matched male-female connection.

WARNING!: Do not use “attach under pressure” quick couplers. The Dawn fx circuit stores hydraulic energy. It is dangerous to keep stored energy in the circuit when detached for storage.

CAUTION!: To maximise the life and operational consistency of your hydraulic units, take care to reduce likelihood of contamination of the hydraulic circuit. Leave caps on unused hydraulic hose ends and fittings. When installing, wipe a small amount of hydraulic oil on the O-ring prior to assembly of a connection.

CONTROL VALVE COMPONENTS

Familiarize yourself with the location and function each component on your Dawn hydraulic control valve. Refer to parts breakdown for specific part numbers.


Pressure Transducer - Gives digital pressure signal to control box
Pressure Gauge
Relief Valve with Tamper Proof Cover
DO NOT ADJUST
Preset to 2500psi
Solenoid with electronic control takes signal from cab to adjust Dawn tools
Manual Override adjustment under cap

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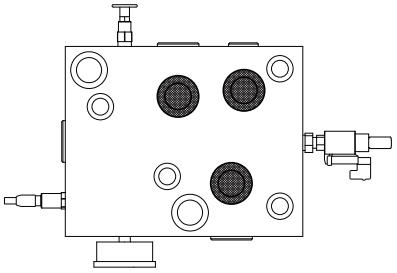
MULTIPLE VALVE STACKING & PLUMBING

VALVE STACKING & ATTACHMENT

Stacking valves for multiple sections can reduce the number of hydraulic tractor ports being used. With the valves properly attached, only one set of positive pressure (PRESS) and return flow (RTN) ports per stack are connected to the tractors SCVs ports. All valves will need to be wired independently for individual control.

NOTE If you are not stacking valves, proceed to step 4.

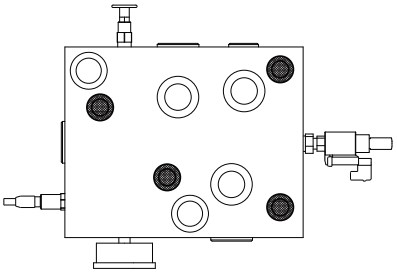
1 Use 1/4" allen key to remove port plugs on the top and/or bottom of the control valve bodies you are stacking. Only remove plugs from ports you plant to connect!



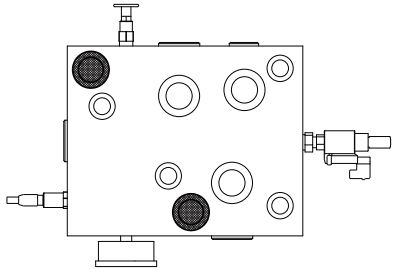
Hydraulic through-ports for valve stack assembly.

2 Lubricate O-ring (Dawn part #90317) with clean hydraulic fluid and place in open port.

3 Place control valve bodies in position and secure with appropriate length 3/8" hex head cap screws and nuts. Use ~100lb torque to secure nuts.

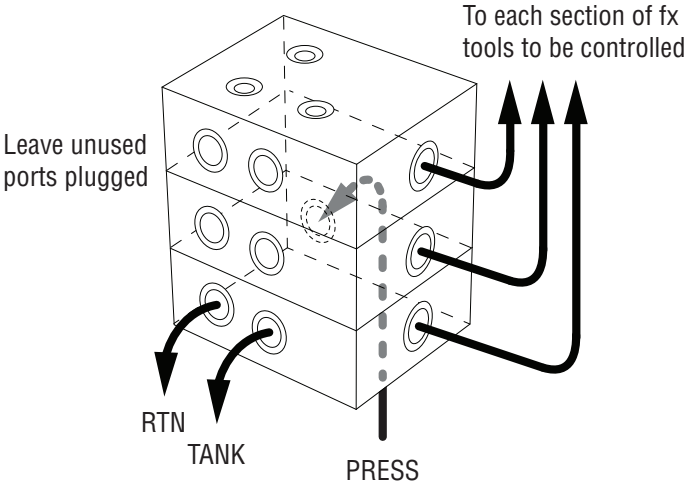


4 Once your valve stacks are assembled and secured, attach them to your planter using two 1/2" socket head cap screws of appropriate length.



NETWORKING MULTIPLE SECTIONS

Once your valve stack is assembled, plumb ONE control valve to the tractor's hydraulic ports (PRESS, RTN, and TANK). Refer to the following page to plumb the "master" valve. Hydraulic fluid flows between the valves. Each control valve will need to be properly connected to a digital control box.



NOTE Read your tractors manual or contact its manufacturer for details concerning hydraulic port sizes/connections, and flow.

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CONTROL VALVE SETUP - PLUMBING

HYDRAULIC CONTROL VALVE PLUMBING

Typically the valve will be mounted on the tongue of the planter at the bulkhead so that it is not permanently tied to the tractor. The gauge should be installed so that the tractor operator can see it from her/his seat. Quick electronic couplers with dust shields are provided for safe storage of your planter. The following guide will help to identify the ports and connections on your hydraulic control valve(s).

PLTR - This Female -8 ORB port connects the control valve to Dawn fx tools.

PRESS - This Female -8 ORB port (shipped with 8mm Allen plug) connects your tractors positive pressure SCV port to the hydraulic circuit.*

RTN - This Female -6 ORB (shipped with 1/4" SAE plug) port connects your hydraulic circuit to your tractors return pressure SCV port.*

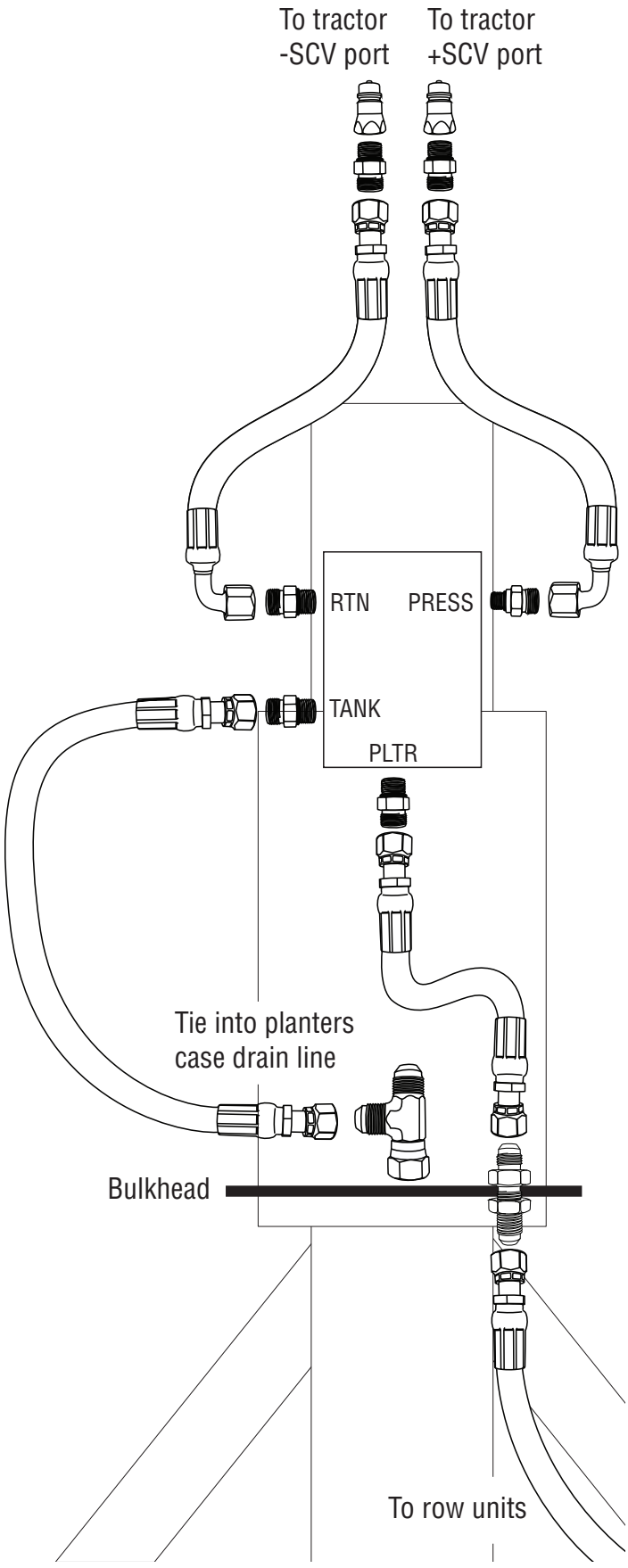
TANK - This Female -8 ORB port (shipped with 8mm Allen plug) connects the hydraulic circuit to your tractors low pressure tank/case drain.

⚠ **WARNING!:** Do NOT tie Dawn fx tools into a line running higher than 20gpm, it will damage the valve.

⚠ **CAUTION!:** Do NOT EVER operate the circuit without at least one TANK drain line connected or when blocked. Operation of the control unit with the TANK drain line plugged is guaranteed to damage the control valve.

CAUTION!: If you are using a power beyond port, you will need to source a needle valve to control flow as these ports aren't regulated and will damage the Dawn control valve. When adjusting the needle valve, slowly open the valve until "whistling stops."

***NOTE** It MAY possible to attach the PRESS and RTN ports to a T-fitting in order to tie it in with Variable Rate Drive by increasing the flow rate slightly. It will NOT be possible to tie into a Variable Rate Drive that utilizes load sensing! Dawn recommends using a dedicated remote for fx tools.



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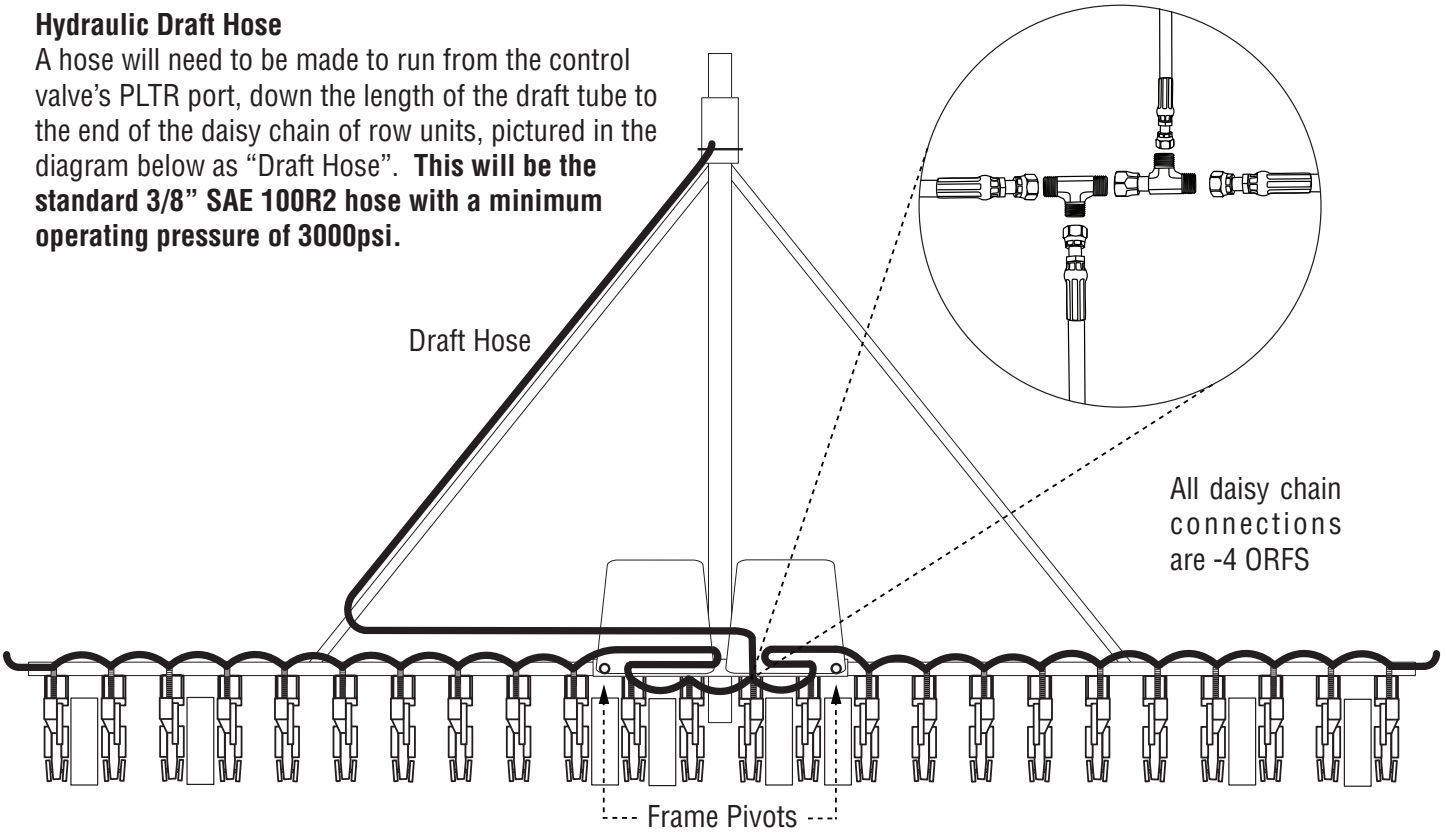
HYDRAULIC CIRCUIT ASSEMBLY & ROUTING

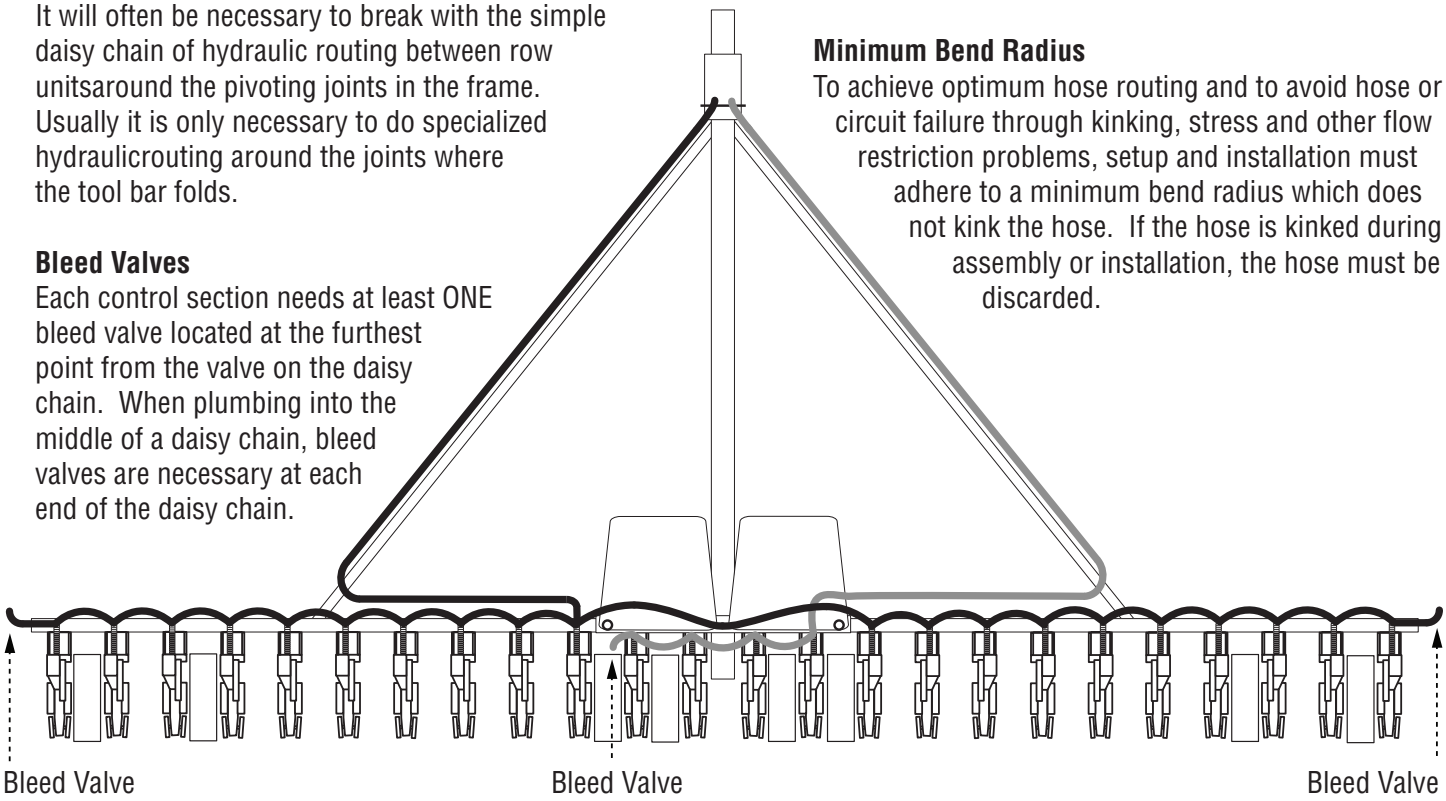
Hydraulic Draft Hose
A hose will need to be made to run from the control valve's PLTR port, down the length of the draft tube to the end of the daisy chain of row units, pictured in the diagram below as "Draft Hose". **This will be the standard 3/8" SAE 100R2 hose with a minimum operating pressure of 3000psi.**



Hydraulic Hose Routing Around Frame Pivots
It will often be necessary to break with the simple daisy chain of hydraulic routing between row unitsaround the pivoting joints in the frame. Usually it is only necessary to do specialized hydraulicrouting around the joints where the tool bar folds.

Bleed Valves
Each control section needs at least ONE bleed valve located at the furthest point from the valve on the daisy chain. When plumbing into the middle of a daisy chain, bleed valves are necessary at each end of the daisy chain.

Minimum Bend Radius
To achieve optimum hose routing and to avoid hose or circuit failure through kinking, stress and other flow restriction problems, setup and installation must adhere to a minimum bend radius which does not kink the hose. If the hose is kinked during assembly or installation, the hose must be discarded.



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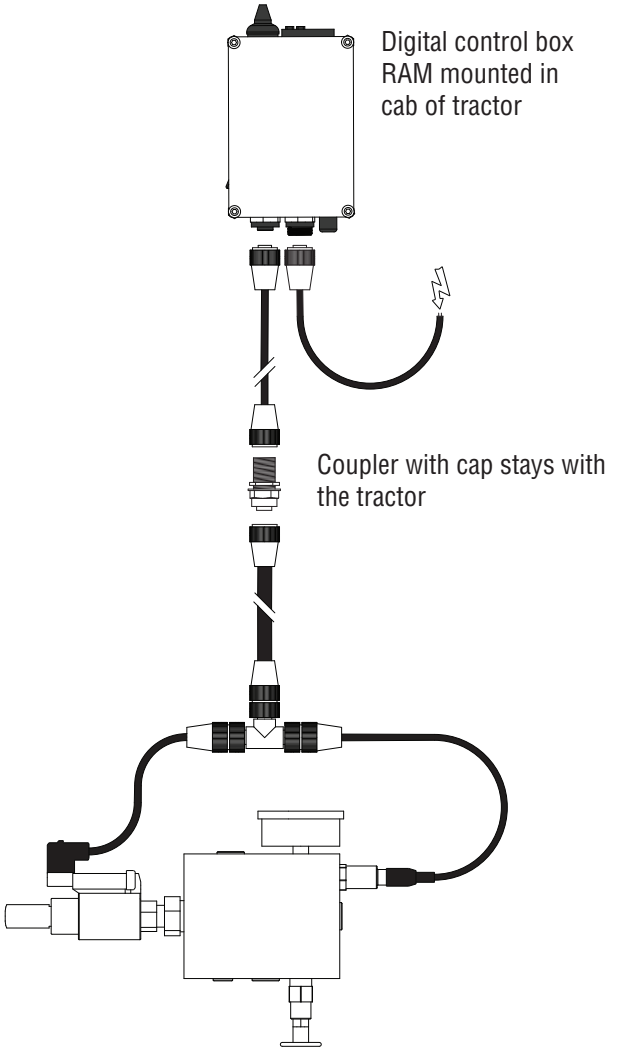
CONTROL VALVE SETUP - WIRING

WIRING THE CONTROL VALVE

The Dawn fx control kit comes with several cables which need to be assembled correctly in order to function properly. Please take note of the following diagram for correct connections.

NOTE Refer to parts breakdown at the end of this document for individual parts number for reference and/or replacement.

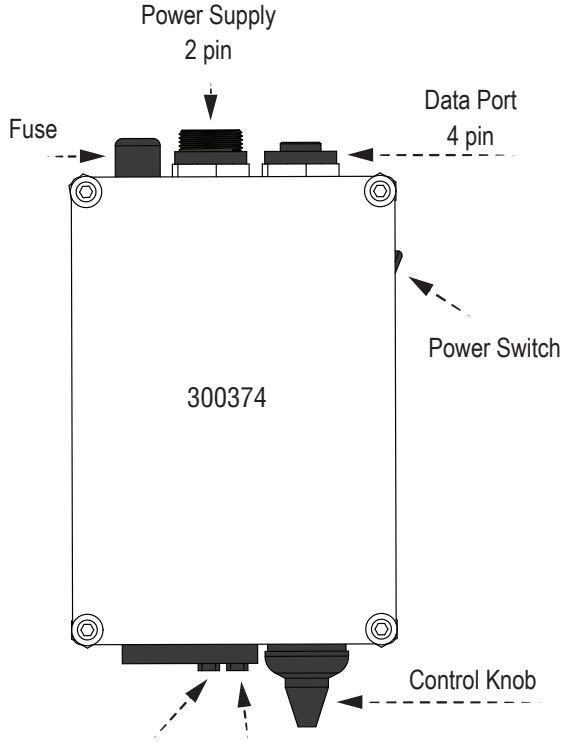


DIGITAL CONTROL BOX

The primary function of this control box is to monitor and regulate the hydraulic pressure within the Dawn fx circuit in order to apply the appropriate amount of down pressure to your fx row unit. Take note of the gauge attached to the hydraulic control valve stack which precisely measures the hydraulic pressure within the circuit. The digital readout on the control box, unlike the gauge, represents a percentage of the maximum pressure within the circuit; 3000psi in this case. For safety reasons, the pressure relief valve on the control valve assembly is factory pre-set to a maximum of 2500psi, and as a result, your digital readout will peak at around 80. Please note that the knob does not actually control this readout directly, nor does it represent a unit of weight of down pressure force, but rather a percentage of flow to the hydraulic circuit.

⚠ **WARNING!:** Risk of electric shock increases when moisture is present.

⚠ **CAUTION!:** Due to the electronic nature of this unit, always be aware of the its environment. Exposure to moisture may lead to malfunctions and will void the warranty of the device.



Digital Display with LEFT and RIGHT buttons

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DIGITAL CONTROL - INSTALLATION & PROGRAMMING

INSTALLATION

Once hydrualic control valve is securely attached to the planter, begin assembling the wiring harness for digital control.

1 Attach pressure transducer cable (Dawn part #90382-2) to the pressure transducer and solenoid cable (Dawn part #90382-1) to solenoid and join with T fitting (Dawn part #90382-3). Attach armoroed cable and run to quick fitting (Dawn part #90382-9) at bulkhead. Refer to parts diagram above for assembly configuration.

2 Route data cable(s) from bulkhead into cab of tractor, taking care not to create interference with doors or any tractor/ tool bar controls.

NOTE Due to various tractor designs, it may be necessary to use a cable extension. Some articulated tractors require as much as 15 extra feet of cable to connect the hydraulic control valve on the tool bar tongue to the digital control box in the tractor's cabin.

3 The digital control box comes with a RAM type mounting attached to it. To install, detach the base and fasten it securely in a location which is convenient to view and operate while inside the tractor.

4 Connect data cable from hydraulic control valve to the digital control box mounted in tractor's cab.

5 Turn the control knob all the way counter clockwise to the "zero" position.

6 Take the yellow power cable (Dawn part #90382-8) and connect it to the tractor's auxiliary 12V power source. The power cable is set up such that **BLUE IS HOT** and **BROWN IS GROUND**.

NOTE It is assumed you will have a 12V source, due to the design of the unit, you will overload the circuit if higher voltages are used.

7 Connect yellow power cable to the center, two-pin port on the Dawn fx digital control box. If it is getting power correctly the display should illuminate when the power switch is turned on.

PROGRAMMING

Typically the digital control will be supplied pre-programmed. If not the steps below can be used to program the display.

1 With the tractor turned off, disconnect the data cable from the back of the digital control box. Leave the power supply plugged in.

2 While simultaneously holding down both buttons on the front of the display, turn the power switch on. The screen should briefly display P-06, showing that you have entered programming mode.

NOTE To change the **highlighted value**, press the RIGHT button. To **change the menu**, hold down the LEFT button and press the RIGHT button.

3 The first menu will appear as rAnGE , if it does not, scroll through with the LEFT button until it does. When the "range" menu appears, press the RIGHT button to scroll through the options. Select the 0..10V option and press BOTH buttons simultaneously to move onto the next menu.

4 The next menus is MAX . Press the RIGHT button to scroll through options until you see no Press BOTH buttons to move on to the next menu.

5 The next menu is MIn . Press the RIGHT button to scroll through the options until you see no . Press BOTH buttons to move on to the next menu.

6 The next menu is dP. Press the RIGHT button to scroll through the options until the display reads just a single 0 . Press BOTH buttons to move on to the next menu.

7 The next menu is LodCS . Press the RIGHT button and scroll through the options until the display reads 00000. Press BOTH buttons to move on to the next menu.

8 The next menu is HidCS . Press the RIGHT button to scroll through the values until the screen reads 00100 . Press BOTH buttons to move onto the next item, which is the End Program menu.

9 Locate the EndPr menu. Press the RIGHT button to change this to YES . Press BOTH buttons to save.

10 Turn system off, plug data cord in, and restart power.

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BLEEDING THE HYDRAULIC CIRCUIT and INITIAL OPERATION

The Dawn fx kit has been designed to be able to bleed the hydraulic circuit by purging air out of the system from either end of the tool bar. In practice it will be virtually impossible to completely bleed the system in the shop. A certain amount of air will simply need to work itself out over time. You will be able to sufficiently bleed the system using the following procedure.

⚠ **WARNING!:** Before you activate your hydraulic circuit, make sure that all connections are tight. Even if you think you've checked all the fittings, go back and do it again!

1 Attach one end of a 1/4" flexible hose to the bleed valve and run the hose into a bucket. Repeat for bleed valve on opposite end of the planter.

tip: You will be running a few gallons of hydraulic fluid through the system for initial bleed procedure. Be sure to use appropriately sized receptacles in order to prevent spills.

2 Make sure that the pressure setting in the system is set to its minimum by moving the pressure control knob on the control box counter clockwise until it stops, or in the (0) setting. You want to be running a minimum amount of pressure during the bleeding process.

3 As previously noted, there should be a bleed adapter at each end of the tool bar. Open BOTH ends slightly at this time.

4 Keep the knob on the Dawn digital control box at zero and tune the tractors SCV hydraulic control to 1-2 GPM (gallons per minute) or at about 5% of maximum flow.

⚠ **CAUTION!:** Running the tractors SCV flow at more than 20GPM across the pressure control valve will generate too much heat and will shorten component life spans. The Dawn fx row units have very small, single acting hydraulic cylinders. As a result, very little hydraulic flow is required for efficient operation.

5 Gradually increase pressure setting on the electronic control knob until a slow steady stream of fluid is flowing from the bleed adapters. At this point you will likely see spurts and surging coming out of the bleed adapters. Continue the bleed process until you see basically clean fluid coming out.

6 Once clean hydraulic fluid flows freely from the bleed adapter, close the bleed valves. Cycle the circuit a few times using the digital control knob, then re-open the bleed adapters to release air bubbles. After you have cycled about 10 gallons of fluid through the system you can consider the circuit sufficiently bled.

OPERATION OF THE Dawn fx UNIT

Dawn fx tools are in general very simple to operate. By turning the control knob you can apply as much pressure as is necessary to achieve the desired level of row cleaning. There are, however, a few tips we would like to pass on.

FLOW RATE

Run the minimum flow rate necessary. Usually on Deere planters this is a setting of .5-.7 with the maximum ever used being about 1.5. This is on a scale of 1-10 so for most tractors you will be using less than 10% of the available flow. Any additional flow will simply waste power and also increase the stress and temperature on the control manifold, valves and also the tractor oil temperature.

FRAME HEIGHT

Dawn tools are designed to work best when the tool bar is kept within 2 inches of the industry standard height of 20" from the bottom of the tool bar to the ground. This is the case with all Dawn planter attachments and implements. Generally the Gfx unit is used on larger planters with multiple sections and a central fill seed distribution system on the center of the frame. On planters of this type the center of the frame almost always runs deeper than the ends of the wings. If you do NOT have markers on the planter you may want to consider adding a weight kit to the ends of the frame if necessary to level out the length of the tool bar, especially on narrow row spaced planters.

NOTE Do NOT check the frame height on concrete or similar surface. Measuring tool bar height must be done in the field.

tip: Consult your planter manual on how to make adjustments. It is also possible to alleviate this problem by running the row units under the center section in a higher hole setting than the wings so that under the full weight of the central seed fill hopper the frame height will be more uniform.

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Frame Level

Because the Gfx unit is frame mounted, it is important to remember that it is designed to work best when the tool bar is level. This is the case with all Dawn planter attachments and implements. Extreme nose-up and nose-down angles of attack will lead to poor performance not only from your Dawn tool, but from the whole planter.

CARE, MAINTENANCE and STORAGE

⚠ **WARNING!:** Always store the disconnected Gfx unit with pressure removed from the circuit. Please refer to your tractor manual on the best way to do this. Failure to release stored hydraulic pressure could result in injury or death.

NOTE No lubrication is required on the Gfx arm and cylinder assembly. The pivot bushings on the cylinder and arm are greaseless and have Never-Seize applied to them at assembly to prevent corrosion. Under extreme use in conditions where very abrasive soils are present it may be advisable to unbolt the arms to clean and re-lubricate the bushings annually.

LUBRICATION

The Trashwheel hubs are the main lubrication point on the Gfx unit. Every 120 acres per row, the pipe plugs should be removed and the supplied grease zerk installed for greasing. Grease should be injected into the hub until you see clean grease exiting the seal area at the back of the hub. Wipe off excess grease with a rag.

CLEANING

At the end of each season the Gfx row units should be hosed down to remove excess grit. It is OK to use a pressure washer to do this, however strong solvents and soaps should NOT be used. For best results the planter should be connected to the tractor and the Gfx system hydraulic pressure should be set at around 50%. this will allow the cylinder rod to be extended slightly so any dirt and debris around the cylinder rod seal can be flushed out. Use the pressure washer without heat and lightly hose off the area around the rod seal to flush any debris that might have become lodged in that area. After completion, cycle the units up and down a few times and release all hydraulic pressure to continue cleaning.

TROUBLE SHOOTING

1 If during operation, the engagement of the hydraulic circuit causes the pressure immediate rise to the system relief (2500psi) and at the same time the electronic control is unresponsive, it is likely that the main SCV return line is not fully connected.

2 If the Dawn fx control system is operating properly in every way except that it does not seem to be generating enough pressure, check that your flow rate is not too high. Hydraulic horsepower is a function of flow and pressure. If you are running at a very high flow for a given amount of horsepower you will reduce your maximum pressure. Solution is to reduce the flow to 10-20% of the system maximum or more typically 2-3gpm.

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Dawn Parts Breakdwon
400124
Electronic Controlled Valve

Item	Dawn Part #	Item Description
1	90382-2	Cable - Pressure Transducer
2	90119-R3	Control Valve with Solenoid
3	90119_R1-3	Replacement Solenoid
4	90382-1	Data Cable - Solenoid
5	90382-3	Tee Fitting for Data Cable

Item	Dawn Part #	Item Description
6	90382-5	Data Cable - Armored
7	90382-9	Data Cable Coupler
8	90382-4	Data Cable - Tractor Cab
9	300374	Electronic Control Box
10	90382-8	Power Cable

* 90119-R3 comes with 90119_R1-3 replacement solenoid, pressure gauge, pressure transducer and manual override.

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Dawn Parts Breakdwon
400124
Hydraulic Circuit Components

Item	Dawn Part #	Item Description
1		Draft hose supplied by dlr.
2	90456	-6MJIC/-6MJIC Union
3	90448	-6FJIC/-4FORFS 23' Hose
4	90127	-4MORFS/-4FORFS/-4MORFS T
5	90446	-4FORFS/-4FORFS 15' Hose
6	90476	-6FJIC/-6FJIC 4' Hose
7	90474	-8MORB/-6MJIC Union
8	90156	-8MORFS/-8MORB Union

Item	Dawn Part #	Item Description
9	90477	-8MORB/-8MJIC Union
10	90157	-6MORB/-8MORFS Union
11	90475	-8FJIC/-8FJIC 4' Hose
12	90158	-8FORFS/-8FORFS 90 8'Hose
13	90156	-8MORB/-8MORFS Union
14	9987	-8FORB/-8M Quick Coupler
15	90457	-8MJIC/-8MJIC/-8FJIC T

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Dawn Parts Breakdwon
300359_R3

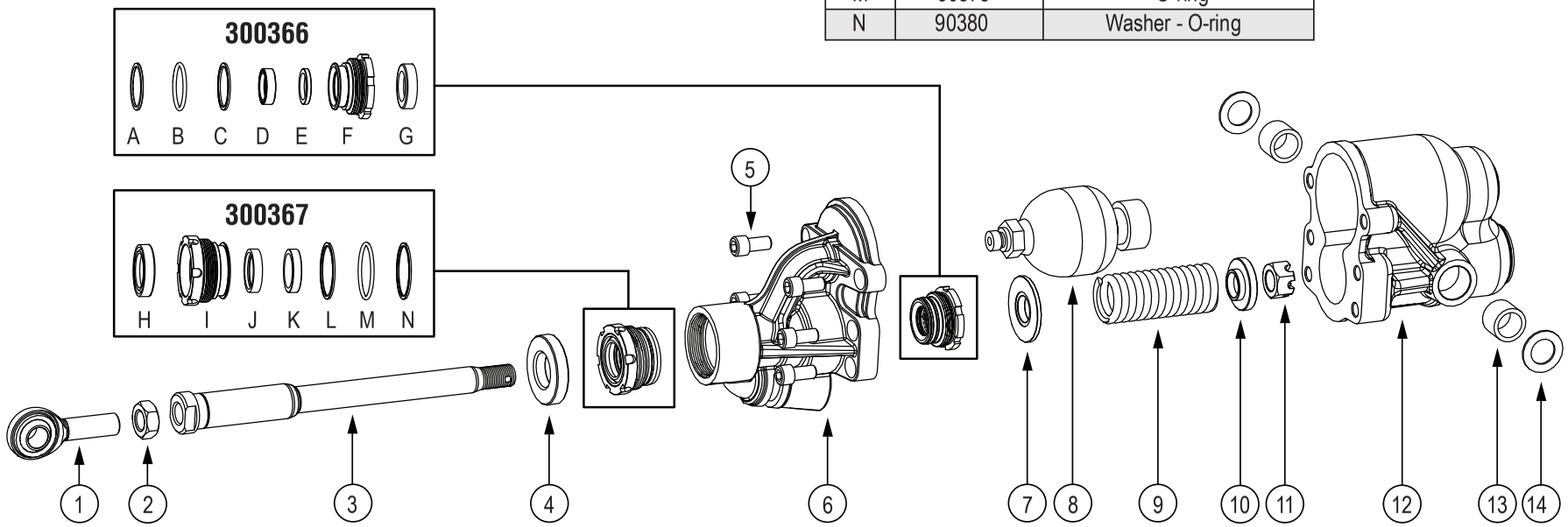
Item	Dawn Part #	Item Description
1	90089	Spherical Bearing
2	90090	Jam Nut 5/8”-18
3	102042_R1	Hydraulic Cylinder Shaft
4	90472	Washer - Rod Stop
5	90151	3/8”-16x3/4” SHCS Stainless
6	102036_R3-M	Gfx Upper Cylinder Casting
7	102399	Spacer - Spring
8	90086R01	Accumulator
9	90088-R4	Gfx Return Spring
10	102044	Washer - Spring Retainer
11	90082	5/8”18 Slotted Nut
12	102038_R2-M	Gfx Lower Cylinder Casting
13	90084	Bushing - Assembly Pivot
14	90148	Washer - Assembly pivot

300366

Item	Dawn Part #	Item Description
A	90381	Washer - O-ring
B	90379	O-ring
C	90381	Washer - O-ring
D	90076	Seal
E	90077	Seal
F	102046_r3	Gland - Outer
G	90072_R3	Seal

300367

Item	Dawn Part #	Item Description
H	90075_R3	Seal
I	102045_r3	Gland - Inner
J	90073	Seal
K	90074	Seal
L	90380	Washer - O-ring
M	90378	O-ring
N	90380	Washer - O-ring



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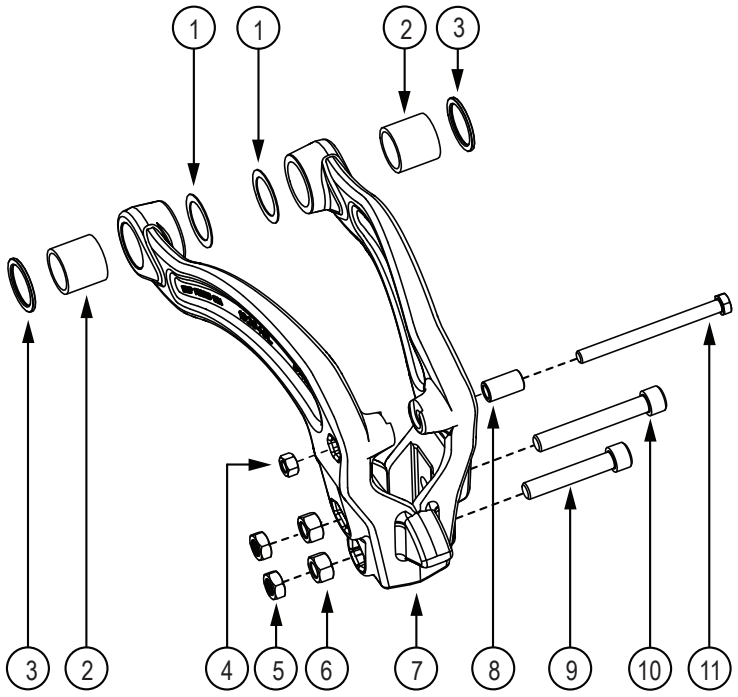
Dawn Parts

2013_4_300358 &
2013_4_300360_R3_UNIV

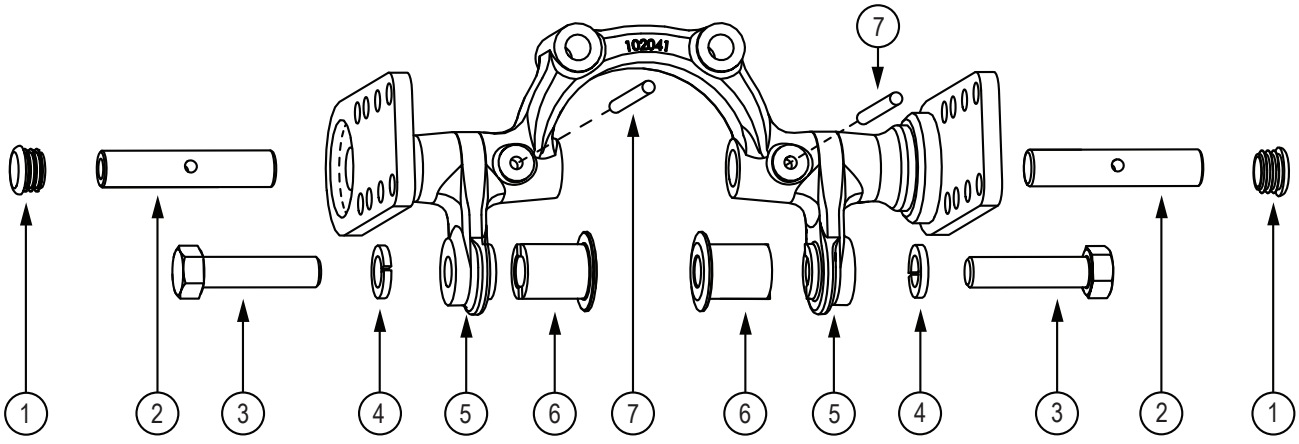
300358

Item	Dawn Part #	Item Description
1	90149	Plastic Thrust Washer
2	90100r2	Bushing
3	102071	Plastic Thrust Washer
4	90081	3/8-16 Gr5 ZN Nut
5	90194	1/2-13 Gr5 ZN Jam Nut
6	9454	1/2-13 Gr5 ZN Nut
7	200901	Gfx Arm Weldment
8	102069	Spacer Bushing
9	90120_R2	1/2-13x2.75” Gr5 ZN SHCS
10	90121_R4	1/2-13x3.75” Gr5 ZN SHCS
11	90376	3/8-16x4.5” Gr8 ZN HHCS



300360_R3-UNIV

Item	Dawn Part #	Item Description
1	90306	Plug
2	102072_R3	Pivot Pin
3	9871	5/8-11x2.5” Gr8 ZN HHCS
4	9069	5/8” Lock Washer
5	200959	Yoke Weldment
6	102064_R2	Rotary Bushing
7	90289	1/4x1 5/8” Pin



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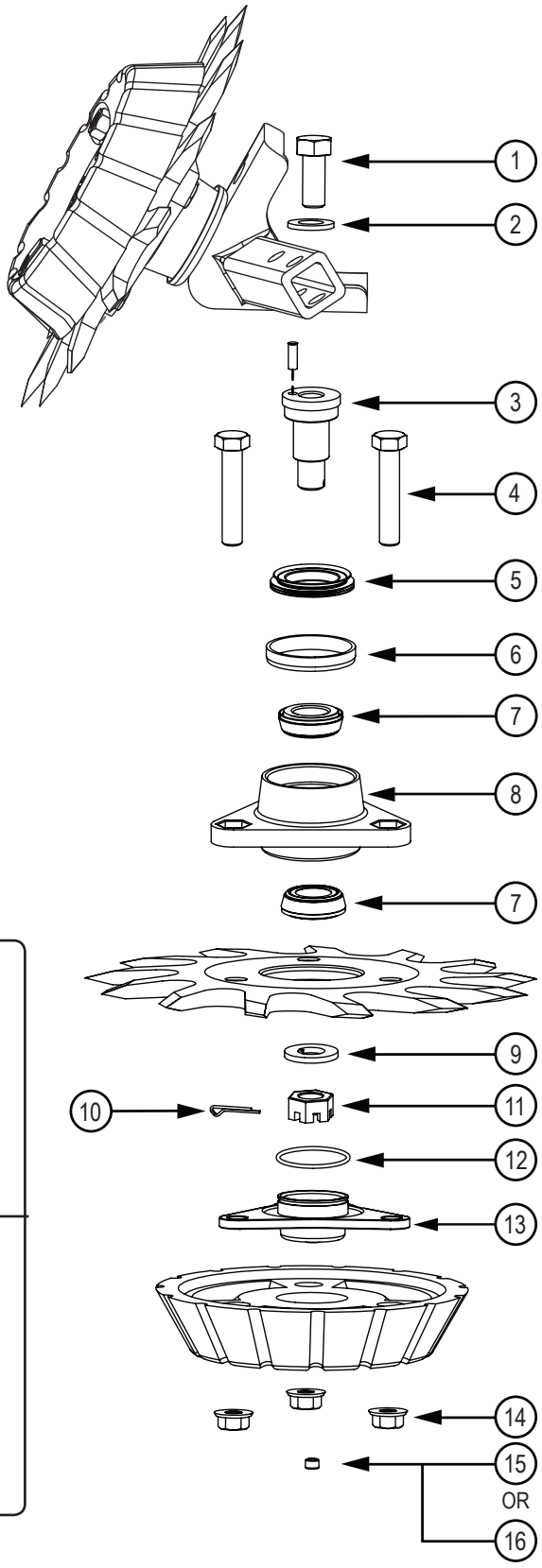
Dawn Parts Breakdwon
1130A-12.75-GFX-DB & 1130A-14-GFX-DB

Item	Dawn Part #	Item Description
1	9101	5/8”-11x1.5” Gr8 HHCS
2	9032	5/8” Flat Washer
3	100066	Threaded Drive Shaft
4	9339	1/2-13x2.5” Gr5 ZN
5	9017	Triple Lip Seal
6	9018	Phenolic Wear Ring
7	9016	Bearing Cone 1”ID
8	300041	Forged Hub Press Assy.
9	9028	Tongue Washer
10	9019	Cotter Pin
11	9024	3/4-13 Castellated Nut
12	9662R01	O-ring
13	100949	Super Cap
14	9007R01	1/2-13 Lock Nut
15	9785	Pipe Plug
16	9806	Grease Zerk



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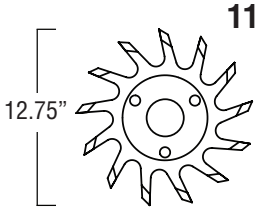

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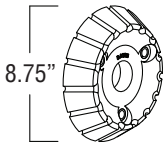
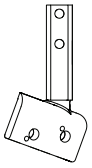


101782

Use with 4-hole stem



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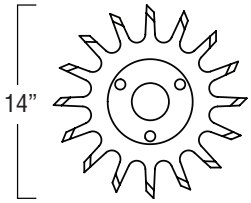

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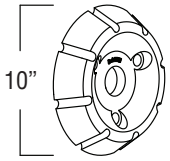
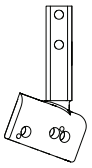


101333

Use with 6-hole stem



200900

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APPENDIX A - WARRANTY

The following warranties with respect to new Dawn Equipment Company ("Dawn") products, excepting as hereafter provided, is made by Dawn to Dealers ("Dealers") authorized by Dawn to sell the products involved and each selling Dealer, in turn, make such warranties to the original retail purchaser ("Purchaser").

A. Duration and Extent of Warranty

1. Products, except all working, moving and all or any parts subject to wear, except as hereafter provided, which are defective in materials or workmanship as delivered to the Purchaser by Dealer will be repaired by a Dealer or replaced by Dawn, only, as Dawn elects, without charge for materials or labor, if such defect appears in not more than 12 months, or from and after the date of delivery to the Purchase by the Dealer.

2. Dawn warrants that the Trashwheels planter attachment wheels (Dawn part #s 200015, 101550, 102185M-L, 102185M-R) and Curvetine closing wheels (Dawn part # 102540F) will not bend or break during its useful lifetime.

3. Liability of Dawn for defective parts or material is specifically limited to the value of the parts or materials, only.

4. All parts or materials requiring work MUST be returned by delivery to the selling Dealer for repair or for delivery to Dawn within thirty (30) days of occurrence of the defect or failure of the part or material, all freight prepaid by the Dealer upon Dealer warranty form, available by request from Dawn. Upon completion of the warranty work, Dawn will ship parts or material to the Dealer, freight prepaid by Dawn.

5. All decisions by Dawn pertaining to warranty are final.

B. Warranty Exclusions; Dawn will not be responsible for any of the following;

1. Defects of damage resulting from use, repairs or service performed in a manner not approved by Dawn or from repairs or service performed by someone other than an authorized Dawn Dealer service department (after approval from Dawn) or Dawn to repair or replace the product involved.

2. Defects, damage or failure resulting from any alteration or additions done in a manner not approved by Dawn.

3. Defects, damage or failure or deprecation resulting from wear and tear, accidents, misuses, negligence, improper maintenance or improper protection and storage.

4. INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO, LOSS OF PROFITS, LOSS OF TIME, LOSS OF CROPS, INCONVENIENCE, LOSS OF USE OF THE PRODUCT OR OTHER MACHINERY, EQUIPMENT OR VEHICLE USED WITH THE PRODUCTS, COST OF RENTALS OR REPLACEMENT OF THE PRODUCTS OR OTHER COMMERCIAL LOSS.

C. Remedies Exclusive: NO Other Warranties

The obligations of Dawn and the Dealers are limited to the obligations set forth in this Limited Warranty. THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES OF DAWN, AND THE DEALERS, EXPRESSED OR IMPLIED. WARRANTIES BY DAWN OR THE DEALER OF CONDITION QUALITY, MERCHANT ABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXCLUDED, AS ARE ALL OTHER REPRESENTATIONS BY DAWN AND THE DEALERS TO THE PURCHASE OR USER AND ALL OTHER OBLIGATIONS OR LIABILITIES OF DAWN AND THE DEALERS. NO OTHER PERSON IS AUTHORIZED TO GIVE ANY OTHER WARRANTY OR TO ASSUME ANY OTHER LIABILITY ON BEHALF OF DAWN AND THE DEALERS. THIS LIMITED WARRANTY MAY NOT BE TRANSFERRED BY THE PURCHASER TO ANY SUBSEQUENT OWNER.

D. The instruction manual supplied with the Product contains important maintenance and service information. Read the manual and follow the recommendations contained herein. Please remember that failures due to improper maintenance or service are not covered by the Limited Warranty.

Dawn Equipment Company reserves the right to make changes in design or specifications at any time without obligation to purchasers or equipment and components previously sold. This warranty shall not be altered or changed in any way.

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